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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,939	10/30/2003	Akihiro Miyauchi	520.43241X00	6291
20457	7590	10/29/2007		
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-3873			EXAMINER HYUN, PAUL SANG HWA	
			ART UNIT 1797	PAPER NUMBER
			MAIL DATE 10/29/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/695,939

Applicant(s)

MIYAUCHI ET AL.

Examiner

Paul S. Hyun

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-14, 16 and 19-31 is/are pending in the application.
- 4a) Of the above claim(s) 6, 9, 16 and 27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 2-5, 7, 8, 10-14, 19-26 and 28-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### **REMARKS**

Claims 2-14, 16 and 19-31 are currently pending with claims 6, 9, 16 and 27 being withdrawn, claims 12, 14, 19 and 24 being amended, and claims 28-31 being new claims. In summary, claims 2-5, 7, 8, 10-14, 19-26 and 28-31 will be examined on the merits.

The objection to the drawings cited in the previous Office action has been withdrawn in light of Applicants' arguments.

The objection to claims 18 and 19 cited in the previous Office action has been withdrawn in light of Applicants' arguments and amendments. However, the objection to claims 21 and 22 are maintained.

The double patenting rejection cited in the previous Office action has been withdrawn in light of the Terminal Disclosure filed by Applicants.

The claim rejection under 35 U.S.C. section 112 cited in the previous Office action has been withdrawn in light of the amendments.

Despite Applicants' arguments, the art rejections are maintained.

### ***Claim Objections***

Claims 21 and 22 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claims, or amend the claims to place the claims in proper dependent form, or rewrite the claims in independent form.

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The limitations recited in claims 21 and 22 are already recited in claim 24. Although claim 24 recites the act of "elongating" whereas claims 21 and 22 recite the act of "stretching", the two terms appear to be identical in scope. In addition, the Specification does not distinguish the difference between the terms.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim **19** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 19 recites the limitation "the functioning substrate". There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims **2-5, 7, 8, 10-14, 19-26 and 28-31** are rejected under 35 U.S.C. 102(e) as being anticipated by Agrawal et al. (US 7,195,872 B2).

Agrawal et al. disclose a substrate comprising a textured surface for conducting chemical and biological reactions. The textured surface is formed by microfeatures,

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which increase surface area for conducting reactions (see Abstract). The microfeatures can be integral with the substrate or be made from a material different from the substrate (see lines 10-17, col. 17). The substrate and the microfeatures can be a thermoplastic organic polymer such as polyethylene, polystyrene and PTFE, which is inherently hydrophobic (see lines 17-35, col. 12) or a metal (see lines 50-65, col. 4). The shape of the microfeatures can be a cone or a pillar (see lines 55-60, col. 4). The microfeatures that form the textured surface can have an aspect ratio less than 10. Specifically, the microfeatures can comprise heights between 0.1 to 100 microns and cross-sections between 0.01 to 500 sq. microns (i.e. about 0.035 microns to 25 microns in diameter if the shape of the microfeature is cylindrical), and the spacing between the microfeatures can be equivalent to the cross-sectional dimensions of the microfeatures, which can range from about 0.035 to about 25 microns if the shape of the microfeature is cylindrical (see lines 18-22, col. 19). The microfeatures can be modified by a coating (see lines 39-67, col. 28), or functionalized with biomolecules such as nucleic acid and peptides to facilitate reactions (see lines 47-65, col. 5). In another embodiment, two substrates 901 and 902 are stacked, comprised of layers of microfeatures (see Fig. 9).

It should be noted that claims 20 and 24 are product-by-process claims. "Even though product-by-process claims are limited by and defined by the process, the determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re*

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*Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Because Agrawal et al. disclose all the structural limitations of the product, it is considered prior art.

Even if the process of making the product did further limit or define the product, Agrawal et al. disclose that the microfeatures can be formed by compression molding (see line 59, col. 16), which is the process that the claims appear to recite. Although the reference does not explicitly disclose the steps of the compression molding, it is well known in the art that compression molding comprises the steps of pressing a mold onto molding material such that the molding material develops the negative shape of the mold, and separating the mold from the molding material.

With respect to claim 10, the claim recites a method step of "lacking" to form clearances, which does not limit the structure of the claimed substrate.

Claim 14 recites intended use of the claimed biochip. Specifically, the claim recites the act of providing the claimed invention in a flow path. It should be noted that limitations directed towards intended use do not have patentable significance.

### ***Response to Arguments***

Applicants' arguments with respect to the art rejections have been fully considered but they are not persuasive.

1) Applicants argue that Agrawal et al. do not disclose the claimed thermoplastic organic polymers because Agrawal et al. generally refer to polymers that can be used to form the microfeatures. This argument is not persuasive because the degree of specificity of a reference is irrelevant with respect to whether it is applicable as a 35 U.S.C. section 102 reference as long as the disclosure of the reference anticipates the

claim limitations. The claims recite that the microfeatures are formed from a thermoplastic organic polymer, and Agrawal et al. disclose that the microfeatures can be formed from PTFE and polyethylene, which are thermoplastic organic polymers.

2) Applicants argue that Agrawal et al. fail to disclose the act of elongating the micro pillars. This argument is not persuasive because the limitation is a product by process limitation. It should be noted that the process by which a product is formed is not patentably significant if the product disclosed by prior art is identical to the claimed product. In this case, the claimed micro pillars does not appear to be distinguishable from the pillars disclosed by Agrawal et al. Moreover, the Specification of the application discloses that the elongation is accomplished by pressing a resin in a mold comprising pits and separating the resin from the mold, wherein the act of removing the resin inherently stretches or elongates the resin. Agrawal et al. disclose that the microfeatures can be formed by compression molding, which is the process (i.e. pressing a resin against a mold having depressions) that the claims appear to recite. Therefore, it is also inherent that the molding disclosed by Agrawal et al. also comprises the stretching or elongating step that is recited in the claims.

3) Applicants argue that Agrawal et al. do not disclose the aspect ratio recited in the claims. Applicants argue that Agrawal et al. disclose a maximum aspect ratio of less than about 10 with a height of about 0.1 to 100 microns, whereas the claims recite an aspect ratio of four or more. This argument is not persuasive because the disclosure of Agrawal et al. anticipates the claim limitations. It is evident that any aspect ratio between 0-10 is within the range disclosed by Agrawal et al.

4) Applicants argue that the micro pillars are formed by etching or embossing, whereas the claimed micro pillars are formed by molding. This argument is not persuasive because, as addressed above, the process by which a product is formed is not patentably significant if the product disclosed by prior art is identical to the claimed product. Furthermore, Agrawal et al. disclose that the microfeatures can be formed by compression molding.

5) Applicants argue that even if Agrawal et al. do disclose compression molding, the reference still fails to disclose the act of elongating or stretching the micro pillars. This argument is not persuasive because, as partly addressed above, the act of stretching/elongating appears to be an inherent consequence of compression molding. In other words, there is no evidence in the Specification of the application that suggests that an additional stretching or elongating step is accomplished separate from the step of removing the resin from the mold. According to the Specification, when the thermoplastic resin is separated from the thin film, the resin naturally stretches (see lines 16-20, col. 8 of the Specification). Claims 30 and 31 even recite that the stretching/elongating of the micro pillars is due to the nature of the polymer (e.g. polyethylene, polystyrene) used to form the micro pillars, and not due to a separate stretching/elongating step. Because the stretching is an inherent outcome of compression molding of certain polymers, it is inherent that the polymers disclosed by Agrawal et al. (e.g. polyethylene and polystyrene) are also stretched when they are removed from the mold.



6) Applicants argue that Agrawal et al. do not disclose that the microfeatures are self-supporting, as recited in claim 2. Although Agrawal et al. do not explicitly disclose that the microfeatures are self-supporting, it is evident from the disclosure and the Drawings that they are self-supporting. The microfeatures disclosed by Agrawal et al. do not require a supporting stricture.

7) Applicants argue that Agrawal et al. do not disclose the limitations recited in claims 4 and 5. This argument is not persuasive because Agrawal et al. disclose that the microfeatures can be in the shape of a cone, as indicated in the rejection above. A cone anticipates the shape recited in claims 4 and 5.

8) Applicants argue that Agrawal et al. do not disclose the limitations recited in claim 7. This argument is not persuasive because Agrawal et al. disclose that the microfeatures can be made from PTFE, which is well known to be hydrophobic.

9) Applicants argue that Agrawal et al. do not disclose the limitations recited in claim 8. This argument is not persuasive because Agrawal et al. disclose that the microfeatures can be coated with metal, as indicated in the rejection above.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

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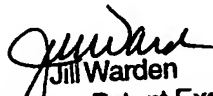
shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul S. Hyun whose telephone number is (571)-272-8559. The examiner can normally be reached on Monday-Friday 8AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571)-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

PSH  
10/23/07

  
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